



September 30, 2011
Project No. 8128.01.12

Dana Bayuk
Project Manager
Oregon Department of Environmental Quality
2020 SW 4th Avenue
Portland, Oregon 97201-4987

Re: DEQ Comments on the Draft Groundwater Source Control Measures Final Design Report
(AnchorQEA, LLC – 5/9/11)

Dear Dana:

Pursuant to discussion with Siltronic Corporation (Siltronic), Maul Foster & Alongi, Inc. (MFA) has prepared the following letter, which is intended to express and clarify Siltronic's position on several issues of great importance raised in the letter from the Oregon Department of Environmental Quality (DEQ) dated September 22, 2011 that conveys comments regarding the above-referenced report (referred to herein as the SCM Design report). The SCM Design report was prepared by AnchorQEA LLC (AQ) on behalf of NW Natural (NWN). Siltronic wishes to reiterate its request that it be directly involved in discussions between DEQ and NWN that have direct impact on Siltronic's property and business interests.

DEQ's letter reiterates that Segment 1 (of the NWN Site, which includes the Siltronic property to the extent it is affected by MGP wastes) is a priority for source control. Siltronic agrees that upland source control of the Alluvial water bearing zone (WBZ) and the parallel engineering evaluation/cost analysis (EE/CA) of the Gasco Sediments Site are priority elements for reducing potential risk to human health and the environment in the Willamette River. Siltronic is committed to help to advance these projects, but wishes to stress that they must be properly integrated to be completed in an effective and practicable manner.

Siltronic is concerned that DEQ's directions to NWN may unintentionally impede progress on the integrated cleanup of the site. DEQ's direction that NWN should re-evaluate the alignment and sequence of the fill-zone interceptor trench installation fails to consider known and potential impacts to Siltronic's operations and facilities that would result from this significant construction activity. Siltronic's concerns, as explained in greater detail below, warrant further consideration and study.

RESPONSES TO DEQ's GENERAL COMMENTS

On page 6 of the DEQ's General Comments letter, DEQ states:

In addition to the reviews completed by the ACOE, EPA, and DEQ, and given the Revised Interim Design Report includes the northern portion of the Siltronic Property,

DEQ understands Siltronic provided NW Natural with comments which were fully incorporated into the document prior to its being issued to DEQ.

This statement correctly indicates Siltronic's approval of the document but overstates the extent to which Siltronic's comments were actually incorporated into the SCM Design report. MFA and Siltronic provided comments to AQ and NWN that primarily focused upon the new SCM element (i.e. the fill-zone interceptor trench). After discussion with AQ and NWN, Siltronic agreed to hold in abeyance its concerns about bank stability and the need for a full engineering evaluation because it agreed with the sequencing proposed by AQ in the SCM Design report. In short, Siltronic supported NWN's recommendation to delay implementation of the interceptor trench until that work can be included in an integrated design with in-river/riverbank sediment removal so that continuing bank stability can be fully evaluated. DEQ was made aware of Siltronic's position during conversations that preceded DEQ's September 22nd comment letter.

The schedule for submittal of the SCM Design report did not allow for a full evaluation of the feasibility of installing an interceptor trench with significant site-specific engineering challenges. These challenges include:

1. Stability – The depth and location of the proposed trench, along with the anticipated sediment removal at the toe of the slope below the shear plane that will be created by the trench, represent a very real risk to the stability of the Siltronic property and structures. Siltronic's experience with fill-zone excavation at the site underscores its concern about the stability of the fill material under saturation conditions. DEQ's suggestion that moving the trench upland to reduce the risk of slides into the river merely transfers the risk to increasing the potential for undermining the Siltronic building and is not an acceptable approach.
2. Vibration impacts – DEQ is aware that Siltronic's manufacturing and testing processes are sensitive to disruption from induced vibration. This required extensive testing of vibration-related impacts by NWN and Siltronic to evaluate the feasibility of constructing a sheet pile wall along the Gasco riverbank. Vibration testing for the construction of a sheet pile wall included measurement of the vibration resulting from trenching prior to sheet pile driving. The results suggest that vibration impacts from trenching in the native soils on the NWN property were attenuated and did not have significant impact on Siltronic operations. However, measurements along the Siltronic river bank showed that vibrations along the Siltronic property were NOT attenuated and would propagate along the entire length of the accelerometer array employed in that study. The vibration testing established that equipment required for excavating a trench 30 feet deep could potentially result in significant vibration impacts. Such effects can best be minimized by locating the trench as far away from the building as possible. DEQ's suggestion that moving the trench further upland overlooks the risk of vibration-related impacts to Siltronic's operations.

Based on the sequence discussed with NWN and DEQ during the February 3, 2011 meeting, Siltronic believed the engineering associated with these challenges would necessarily be deferred until after the sediment removal project had been completed or at least designed. DEQ's direction to change the sequence of the Fill WBZ SCM does not allow for timely completion of a

complete engineering study that will take into account potential dredging at the toe of the riverbank slope. Moreover, even if such a study were to be undertaken presently, DEQ's direction will likely delay implementation of source control for the Alluvial WBZ, which Siltronic, NWN, DEQ, and USEPA all agree is the priority for upland source control.

On page 11, DEQ states:

The Revised Interim Design Report recommends constructing the Fill WBZ interceptor trench concurrently with the riverbank cleanup included in the in-water sediment remedy. DEQ understands the primary justification for the recommendation is the presence of shoreline structures, including the FAMM tank farm, FAMM office, Siltronic's outfall, and docking and mooring structures.

DEQ's stated understanding regarding the justification appears to conflate two distinct issues: the presence of structures and the timing of trench construction. With respect to structures, DEQ notes "Shoreline interferences are primarily associated with the FAMM leasehold." This does not consider the unique problems that will be encountered with siting the Siltronic portion of the interceptor trench. For example, the only open space available for the interceptor trench at Siltronic is on the riverbank side of the access road, due to the presence of buried utilities, including stormwater piping, the combined NPDES/stormwater outfall, electrical feeder lines (12,500V) below the roadbed, and firewater supply and hydrants parallel to the riverside curb. Some of these utilities were most recently described in the Siltronic Stormwater Source Control Evaluation Report (submitted December 2010, and currently under review by DEQ). Siltronic's manufacturing operations also require continuous use of the north access road for movement of materials.

DEQ notes "Setting the trench back from the top-of-bank will reduce uncertainty regarding slope stability and intercept contaminated groundwater further upgradient of the river." Siltronic urges DEQ to acknowledge that a complete engineering evaluation is necessary before decisions are made about construction technique, location and sequencing of the Fill WBZ groundwater source control measures along the Siltronic portion of Segment 1. Also, it is not clear how intercepting groundwater further upgradient of the river provides a benefit with respect to limiting contaminant loading, as locating the interceptor trench upgradient will result in a larger "stranded wedge" of Fill WBZ groundwater discharging to the river. This seems counter to DEQ's interest in prioritizing Fill WBZ source control.

On page 12, DEQ notes that the estimates of flow through the Fill WBZ may be low. MFA has observed that the silt layer separating the two water bearing zones is not continuous (especially on the Siltronic property). Irrespective of the estimated conditions, the actual flow through the Fill WBZ and the resulting design parameters will not be fully understood until after the full scale Alluvial WBZ groundwater extraction has reached steady state. This data gap further reinforces the view that the remedy design should be sequenced consistent with AQ's proposed approach.

On page 13, DEQ states:

Implementation of groundwater SCMs should satisfy two conditions: 1) the interceptor trench and HC&C system should preserve maximum flexibility in accommodating the

range of options for remediating bank soil and river sediment, and 2) future riverbank work should not interfere with construction of groundwater SCMs or compromise groundwater SCMs during riverbank sediment remedy construction.

In their review of the proposed sequence, DEQ does not consider the potential for the interceptor trench to weaken bank stability where steep slopes are present, such as at the Siltronic property. Siltronic is concerned that the potential for major bank instability, including mass wasting and slides into the river, is a real and significant danger to the viability of Siltronic's operations resulting from DEQ's direction regarding sequence. Such damage would also impact implementation of the sediment remedy, which would run counter to condition (1) indicated in DEQ's comment restated above. DEQ must also consider that once installed, the interceptor trench and appurtenances will represent an additional physical obstacle that will limit options for future riverbank restoration work. For example, heavy equipment may not be compatible with the less competent trench material at the surface, and may compromise the function of the trench. This appears to run counter to condition (2), indicated above.

SUMMARY

DEQ's comments appear to require NWN to re-evaluate many fundamental assumptions regarding the design and installation of the groundwater extraction system. DEQ appears to be particularly concerned with the predictive accuracy of the groundwater flow model. MFA notes that the best achievable goal of any groundwater model is to test theories about groundwater flow and contaminant transport, for the purposes of making general decisions. Subsequent actions and data should then be used to refine the model under different conditions, allowing for adaptive management. While DEQ's directions regarding refinement and increased accuracy of the model results may improve performance monitoring or system operation, additional modeling is not likely necessary at this time to move forward with installation of the Alluvial groundwater extraction system.

Siltronic recommends an adaptive management approach for an integrated remedy of the Gasco site. DEQ's approach prescribes implementation of source control in the fill zone prior to evaluation of the effects of groundwater extraction from the Alluvial WBZ. For example, it may prove to be the case that Alluvial groundwater extraction will reduce groundwater elevations in the Fill WBZ since, as MFA notes, the silt unit between the Fill and Alluvial zones is not continuous throughout the site. In this context, it is a reasonable approach for DEQ to approve installation and operation of the Alluvial SCM, and simultaneously require evaluation of the effects of full-scale pumping on the Fill WBZ.

Finally, MFA notes that many of the issues and concerns associated with installation of an interceptor trench, especially on the Siltronic property, can be obviated by replacing the trench with a horizontal extraction well. MFA has suggested this concept to AQ, and hopes that this alternative will be fully evaluated.

Siltronic appreciates the progress demonstrated by NWN in advancing upland source control. As NWN and DEQ resolve the differences related to approach and managing uncertainty that are

evident in DEQ's comments, Siltronic again requests that it be represented in discussions and meetings regarding implementation of upland source control on its property.

Please call either of us at (971) 544-2139 if you have questions or comments.

Sincerely,

Maul Foster & Alongi, Inc.



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Senior Hydrogeologist



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Principal Engineer

cc: Tom McCue and Myron Burr, Siltronic Corporation
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